**DNA Replication Activity**

**Bead Kit KEY**

* **Red bead = phosphate**
* **White bead = deoxyribose**
* **Blue, green, yellow, orange = nitrogen bases**
* **Clear connectors = hydrogen bonds**

**Nucleotides:**

1. Use your notes and/or textbook to construct the 4 different nucleotides.
2. Make a drawing and label the parts of each one below: *Use color since your beads are colored!*

**DNA:**

1. Now you will need to construct a double-stranded molecule of DNA. It must be complementary and antiparallel chain of nucleotides. It must be 10 nucleotides long. Everyone has unique DNA, so yours should NOT look like your neighbors! NO TWINS!
2. Make a drawing of your DNA below. Use color or symbols to note different nitrogen bases *and* label the 5’ and 3’ ends. (you can also take a picture and insert it later; needs to be in color)

**DNA Replication:**

1. Unwind and separate 7 pairs of nitrogen bases from one end. What enzyme did you just mimic?
2. DNA polymerase always lays nucleotides in the 5’ to 3’ direction from a 3’ to 5’ template. Connect 5 nucleotides to the *leading strand*.
3. Now, connect 4 nucleotides to the *lagging strand*. You need to show two Okazaki fragments being made with the 4 nucleotides.
4. Make a drawing of your DNA replicating with its leading and lagging strand. Label the leading, lagging strands, Okazaki fragments, replication fork and use an arrow to note the direction of growth. (*you can insert a photo of your model, but must be labeled*)
5. What enzymes are involved in the process of DNA replication? What does each of these enzymes do?
6. Why does a pyrimidine only bond with a purine?
7. What does it mean to say the two strands are complementary to each other?
8. Using Chargaff’s rules of base pairing, if a sample of DNA has 20% of Guanine, what % of Adenine must there be?
9. What kind of DNA replication did you just simulate?